

### **AMENDMENTS TO THE CLAIMS**

This listing of claims will replace all prior versions, and listings, of claims in the application.

#### **Listing of Claims**

1. (Currently Amended) An initial synchronization searching method of a mobile communication system, the method comprising:

selecting a region for an initial synchronization from an input signal, wherein selecting the region comprises:

respectively accumulating input signals of a channel I and a channel Q, and obtaining an absolute value for the channel I and an absolute value for the channel Q,

adding the absolute value for the channel I and the absolute value for the channel Q to obtain a power distribution, and

estimating a region as a candidate region from the power distribution obtained by adding the absolute value for the channel I and the absolute value for the channel Q, the estimated region having a high power distribution in the power distribution of the added absolute values; and

obtaining an initial synchronization by correlating the selected region and a synchronous code, wherein obtaining the initial synchronization includes:

obtaining a correlation value of each of a plurality of candidate-region regions, and

Reply to Office Action dated March 31, 2008

judging that synchronization has been obtained in a corresponding one of  
the candidate region-regions if a specific correlation value is greater than a threshold value.

2. (Canceled)

3. (Currently Amended) The method of claim [[2]]1, wherein the accumulating is performed by a circulation buffer.

4. (Currently Amended) The method of claim [[2]]1, wherein the estimating comprises:

searching the region with the high power distribution from the added absolute values;

checking whether a length of the region corresponds to a search range; and

estimating the region as the candidate region if the length of the region with the high power distribution corresponds to the search range.

5. (Previously Presented) The method of claim 4, wherein the search range comprises 64 chips.

6-7. (Canceled)

Reply to Office Action dated March 31, 2008

8. (Currently Amended) An initial synchronization method of a mobile communication system comprising:

respectively accumulating I and Q signals and obtaining two absolute values for the I and Q signals;

adding the ~~two absolute values~~ absolute value for the I signal and the absolute value for the Q signal to obtain a power distribution of the added absolute values;

estimating a candidate region from ~~[[a]]~~ the power distribution of the added absolute values; and

correlating ~~the estimated candidate region with a~~ synchronous code with the estimated candidate region from the power distribution of the added absolute values to obtain initial synchronization of a terminal, wherein the initial synchronization includes:

obtaining a correlation value by correlating the candidate region and a synchronous code, and

judging that synchronization has been obtained at the corresponding candidate region if the specific correlation value is greater than a threshold value.

9. (Previously Presented) The method of claim 8, wherein the estimating comprises: searching for a region with a high power distribution from the absolute value of one frame;

checking whether a length of the region with the high power distribution corresponds to a search range; and

Reply to Office Action dated March 31, 2008

estimating a corresponding region as the candidate region if the length of the region with the high power distribution corresponds to the search range.

10. (Previously Presented) The method of claim 9, wherein the search range comprises 64 chips.

11. (Canceled)

12. (Currently Amended) An apparatus in a mobile communication system comprising:

first and second accumulation buffers to respectively accumulate I and Q signals;

first and second absolute value calculators to obtain an absolute value from ~~outputs of the first and second accumulation buffers~~an output at the first accumulation buffer  
and to obtain an absolute value from an output of the second accumulation buffer;

~~an adder to add outputs of the first and second absolute value calculators~~the  
absolute value output from the first absolute value calculator and the absolute value output from  
the second absolute value calculator;

an estimator to estimate a candidate region for initial synchronization from the added absolute values; and

a synchronization searching unit to obtain an initial synchronization of a terminal by correlating the estimated candidate region and a synchronous code.

Reply to Office Action dated March 31, 2008

13. (Previously Presented) The apparatus of claim 12, wherein each of the first and second accumulation buffers comprises a circulation buffer.

14. (Currently Amended) The apparatus of claim 12, wherein the estimator ~~is configured to search a region having a high power distribution from an absolute value of one frame and to estimate a region with a length of a power distribution corresponding to a search range as a candidate region.~~

15. (Previously Presented) The apparatus of claim 14, wherein the search range comprises 64 chips.

16. (Currently Amended) The apparatus of claim 12, wherein the synchronization searching unit ~~is configured to obtain a correlation value by correlating the candidate region and a synchronous code, and if a correlation value is greater than a threshold value, the synchronization searching unit is configured to judge that synchronization has been obtained in the corresponding candidate region.~~

17. (Previously Presented) The apparatus of claim 12, wherein the apparatus comprises a base station.

Reply to Office Action dated March 31, 2008

18. (Previously Presented) The apparatus of claim 12, wherein the apparatus comprises a mobile terminal.

19. (Original) The apparatus of claim 12, wherein the apparatus comprises at least one base station and at least one mobile terminal.

20. (Original) The apparatus of claim 12, wherein the communication system is at least one of a Time Division-Synchronous Code Division Multiple Access (TD-SCDMA) communication system and a Universal Mobile Telecommunications System-Time division Duplexing (UMTS-TDD) communication system.

21. (Currently Amended) An apparatus comprising:

accumulation buffers and absolute value calculators to receive the I signals and the Q signals, to generate an absolute value for the I signal, and to generate an absolute value for the Q signal;

an adder to add the absolute value of the I signal and the absolute value of the Q signal, and to generate the added values of the I and Q signals as a power distribution;

an estimator configured to receive the power distribution of the added values of the I and Q signals from the adder, and to select a region from an input signal, wherein the input signal comprises a combined value of I and Q signals the power distribution of the added value of the I and Q signals;

Reply to Office Action dated March 31, 2008

a synchronizer ~~configured~~ to determine an initial synchronization from the region by correlating the selected region to a synchronization code, wherein the initial synchronization is determined by:

obtaining a correlation value by correlating the candidate region and a synchronous code, and

judging that synchronization has been obtained at the corresponding candidate region if the specific correlation value is greater than a threshold value.

22. (Canceled)

23. (Currently Amended) The apparatus of claim ~~[[22]]~~21, wherein the accumulation buffers comprise circular buffers.

24. (Currently Amended) The apparatus of claim 23, wherein the accumulation buffers ~~are configured~~ to accumulate a plurality of oversampled I and Q signals, respectively.

25. (Currently Amended) The apparatus of claim 21, wherein the estimator is ~~configured to select the region by searching the input signal and selecting a region of the power distribution~~ that has a relatively high power distribution in comparison to the remaining input signal remaining portions of the power distribution.

26. (Currently Amended) The apparatus of claim 25, wherein the estimator ~~is configured to select the region by comparing a length of the region to a search range.~~

27. (Previously Presented) The apparatus of claim 26, wherein the search range comprises 64 bits.

28. (Original) The apparatus of claim 21, wherein the apparatus is at least one of a base station and a mobile terminal.

29. (Previously Presented) The apparatus of claim 21, wherein the apparatus comprises a mobile communication system.

30. (Original) The apparatus of claim 29, wherein the mobile communication system is at least one of a Time Division-Synchronous Code Division Multiple Access (TD-SCDMA) communication system and a Universal Mobile Telecommunications System-Time division Duplexing (UMTS-TDD) communication system.